Figure 2 Zone 2 Properties with Remedial Designs

10.3 A Synopsis of Secondary Data or Information from Site Reports

EPA will provide a specific list of all properties in Zone 2 that require XRF analysis of soils and a specific list of all properties in Zone 2 and 3 that will be considered for interior dust sampling and cleaning.

10.4 Observations from any Site Reconnaissance Reports

The status of properties that were identified in the RD (SulTRAC 2018) and included in this remedial action (RA) were confirmed with EPA in the January 12, 2018 SulTRAC report to EPA.

10.5 The Rationale for Inclusion of Chemical and Nonchemical Analyses

The COCs in soil, air and dust within residences are lead and arsenic as identified through previous site investigations and the RD (SulTRAC 2018). As such, chemical analyses of:

- excavated soil from residences (if required by EPA);
- disposal stock pile soil;
- air samples during soil excavation and backfill;
- air samples around the disposal stock pile soil; and
- interior dust from residences are required.

The results of chemical and nonchemical analyses performed on backfill materials by a Parsons subcontractor will be provided to Parsons for review to determine acceptability for placement of backfill and topsoil at residential properties and compliance with the specifications.

10.6 Project Decision Conditions

The data quality objectives provided in Worksheet 11 are presented for soil, backfill materials, air sampling at designated residences and the disposal stock pile location, and the interior dust sampling at designated residences.

Worksheet #11—Project/Data Quality Objectives

DQO #	Step 1: Statement of Problem	Step 2: Identify Goals of the Study	Step 3: Identify Information Inputs	Step 4: Define Boundary Studies	Step 5: Develop Analytical Approach	Step 6: Specify performance or acceptance criteria	Step 7: Develop plan for obtaining data
1 Zone 2 Soil	*Problem:* Site-related contaminants of concern (Lead and Arsenic) have been previously identified in surface and shallow soil of residential properties in Zone 2. Additional sampling will be required to characterize the vertical extent of the contamination at select properties, based on the RD (SulTRAC 2018) and may require additional excavation based on the results. *General intended use of collected data:* The data in this study will be used to confirm the vertical extent of the soil characterization of the residential soils. Based on the soil analysis results, additional excavation at some properties may be required.	*Principal Study Question:* Determine vertical extent of subsurface soil with elevated lead and arsenic concentrations to support and confirm the remedial action. *Range of Possible Outcomes:* • Data are sufficient to define the extent of elevated lead and arsenic concentrations at each of the residential properties sampled. • Data are inconsistent with the conceptual site model and additional characterization is required.	*Information Needed to Resolve the Decision Statement:* • Collect subsurface soil samples from required areas at select properties (refer to Worksheet #18) • Screen soil samples with XRF using action levels developed in the FIELDS correlation study. • Laboratory samples may be submitted to confirm screening results if directed by EPA. *Source of information:* RD (SulTRAC 2018) *Parameters/characteristics to be measured:* Lead and Arsenic *Sampling and analysis method:* Based on guidance from the EPA *Superfund Lead-Contaminated Residential Sites Handbook*, the number of composite sampling locations per property is determined by the surface area of each property. Soil sampling will consist of 5-point composite sampling per yard area. Screen composite soil samples with XRF.	*Spatial:* Previous RD/RA did not delineate the vertical extent of lead and arsenic-impacted at approximately 15 residential properties. *Temporal:* Sampling will be performed for selected properties during the RA phase to assess the spatial extents of lead and arsenic.	Composite soil samples will be screened with XRF and may also be sent for laboratory analysis for lead and arsenic. Refer to Worksheet #17.	The data should identify the concentrations and locations of lead and arsenic enough to confirm the objectives of the remedial action. The remedial goals for soil are 400 mg/kg for lead and 26 mg/kg for arsenic. Refer to Worksheets #24, #15, #28, and #36 for acceptance and performance criteria. Laboratory data are considered usable if data validation criteria are met (refer to Worksheet #37 for data usability criteria).	Collect subsurface soil from up to 15 properties using a 5-point composite sampling approach. All soil samples will be screened for lead and arsenic using XRF. Refer to Worksheet #17 for details on the sample collection design and rationale.
2 Zone 2 Borrow Soil	*Problem:* Backfill and topsoil materials are needed to place at residential properties during the RA after excavation. *General intended use of collected data:* Laboratory analysis results from soil sampling will be reviewed by Supervising Contractor (Parsons) to evaluate if the both materials meet project specifications for placement at residential properties.	*Principal Study Question:* Determine if borrow sources are acceptable for use. *Range of Possible Outcomes:* • Data show that the materials meet project specifications. • Data show that the materials do not meet project specifications and alternate borrow and topsoil sources or enhancements (that is, screening or adding soil amendments for soil fertility) are necessary.	*Information Needed to Resolve the Decision Statement:* • Review laboratory analysis results, provided by subcontractor, of soil samples from borrow sources for backfill and topsoil every 1,000 cubic yards. *Source of information:* Project criteria for backfill and topsoil acceptability are defined in subsection 3.3.3.1 of the final RD (SulTRAC 2018). *Parameters/characteristics to be measured:* VOCs, SVOCs, Pesticides, PCBs, Herbicides, RCRA 8 Metals, Grain Size, Atterberg Limits (backfill only), Standard Proctor (backfill only). *Sampling and analysis method:* Soil sampling will consist of 5-point composite sampling per stockpile.	*Temporal:* Sampling will be performed Parsons subcontractor to determine acceptability of borrow source(s) for use. Continued compliance samples will be collected at a frequency of 1 sample per 1,000 cubic yards of each material required.	Refer to Parsons *Exterior Field Sampling Plan for Zone 2* and Parsons Subcontractor QAPP.	The data should be below the criteria for analytes specified in the Parsons Subcontractor QAPP. The data should also identify if the material meets the specified geotechnical requirements.	Refer to the Parsons Subcontractor QAPP. for details on the sample collection design and rationale.

DQO #	Step 1: Statement of Problem	Step 2: Identify Goals of the Study	Step 3: Identify Information Inputs	Step 4: Define Boundary Studies	Step 5: Develop Analytical Approach	Step 6: Specify performance or acceptance criteria	Step 7: Develop plan for obtaining data
3 Zone 2 Air	*Problem:* Site-related contaminants of concern (Lead and Arsenic) have been previously identified in surface and shallow soil of residential properties. Excavation of the soil may cause airborne particulates containing lead and arsenic. Airborne particulates at East Chicago temporary stockpile site may also result from hauling and disposing of contaminated excavated soil. *General intended use of collected data:* Evaluate airborne exposure to lead and arsenic during excavation activities.	*Principal Study Question:* Determine if excavation activities in Zone 2, and at East Chicago temporary stockpile site, are causing exposure to airborne arsenic and lead at levels that pose a health risk. *Range of Possible Outcomes:* • Data indicate that exposure to lead and arsenic concentrations is not occurring at concentrations posing a human health risk. • Data indicate that exposure to lead and arsenic concentrations is occurring at concentrations posing a human health risk, and field procedures need modification.	*Information Needed to Resolve the Decision Statement:* • Collect real-time continuous air samples with data logger. • Collect particulate samples with a perimeter sampling pump. *Source of information:* See air monitoring sampling approach in *Exterior Field Sampling Plan for Zone 2* and *Temporary Storage, Transportation, and Disposal Plan for Zone 2 and 3.* *Parameters/characteristics to be measured:* Lead and Arsenic. *Sampling and analysis method:* Samples will be collected and analyzed for lead and arsenic.	*Temporal:* Real-time air monitoring will be done daily. Perimeter air sampling will be done weekly or more often if necessary. *Spatial:* At each Zone 2 residence during excavation and backfill activities. At the East Chicago temporary stockpile site.	Refer to *Exterior Field Sampling Plan for Zone 2* and *Temporary Storage, Transportation, and Disposal Plan for Zone 2 and 3.* Refer to Worksheet #17 and #18.	The data should identify the concentrations of lead and arsenic present at concentrations above action limits. Refer to Worksheets #24, #15, #28, and #36 for acceptance and performance criteria. Laboratory data are considered usable if data validation criteria are met (refer to Worksheet #37 for data usability criteria).	Use real-time data to guide daily construction activities and implementation of dust suppression measures. During the RA only, collect particulate samples using a perimeter sampling pump. Samples will be analyzed for lead and arsenic by an accredited laboratory. Refer to Worksheet #17 for details on the sample collection design and rationale.
4 Zone 2 & Zone 3 Interior Dust	*Problem Site:* Site-related contaminants of concern (Lead and Arsenic) have been previously identified inside of specific residences. Sources of contaminants may originate from lead-based paint and past and proposed excavation and remediation activities that may cause airborne particulates containing lead and arsenic. *General intended use of collected data:* Evaluate airborne exposure to lead and arsenic within residences in Zone 2 and 3.	*Principal Study Question:* Verify after implementation of one or more cleaning plans and sampling that the interior of specific residences in Zones 2 and 3 are clean enough to allow habitants to return. Range of possible outcomes: • Dust analysis results indicate that exposure to lead and arsenic concentrations is not occurring at concentrations posing a human health risk. • Dust analysis results indicate that exposure to lead and arsenic concentrations is occurring at concentrations posing a human health risk, and additional cleaning is required or no solution is possible.	*Information Needed to Resolve the Decision Statement:* Sampling shall include: • sampling dust in the interior of a residence for lead and arsenic contamination; • screening the interior of a residence for the presence of lead-based paint; and • efficacy sampling to ensure that cleanings are effective.	*Temporal:* Initiate sampling and cleaning after all RDs are completed in Zone 2 and 3. *Spatial:* Focus sampling on specific high use rooms in each residence as guided by *Interior Residential Dust Cleaning and Sampling Plan for Zones 2 and 3.*	Refer to *Interior Residential Dust Cleaning and Sampling Plan for Zones 2 and 3.* Refer to Worksheet #17 and #18.	The data should identify the concentrations of lead and arsenic present at concentrations above action limits. Refer to Worksheets #24, #15, #28, and #36 for acceptance and performance criteria. Laboratory data are considered usable if data validation criteria are met (refer to Worksheet #37 for data usability criteria).	After all RDs are completed collect dust samples for lead and arsenic analysis to determine if cleaning is required. Refer to *Interior Residential Dust Cleaning and Sampling Plan for Zones 2 and 3.* Refer to Worksheet #17 for details on the sample collection design and rationale.

RCRA = Resource Conservation and Recovery Act

11.1 Who will use the data?

The analytical data will be used by Parsons and EPA.

11.2 What will the data be used for?

XRF sample collection and other associated tasks will be conducted to fill data gaps necessary to assist with the excavation of the residential soils. Soil samples of the disposal stock piles will be used to verify if excavated soil will be disposed at a hazardous or non-hazardous landfill. Air monitoring during excavation and backfill and at the disposal stock pile site will be performed to verify that airborne particulates, caused by construction activity, are not posing a human health risk. Interior dust samples collected are required to demonstrate that residences are safe for occupancy after remedial actions and interior cleaning activities are completed. The data collected as part of the remedial action will be used to meet the DQOs.

11.3 What types of data are needed?

Task	Sampling Activity/Objective	Sampling Frequency/ Duration	Matrix	Parameters
Soil	XRF screening of 5-point composite soil samples from residences in Zone 2 for Lead and Arsenic concentrations above action levels	Conduct confirmation soil sampling of excavated soil at properties with incomplete remedial designs (where lead and/or arsenic concentrations exceed RALs at depths of 24-inches and/or where refusal occurred during site characterization activities) using portable X-Ray Fluorescence (XRF) unit	Soil	Metals (Lead and Arsenic) by XRF screening Metals (Lead and Arsenic) by 6010 if directed by EPA
Soil	Disposal Stockpile Site 10-part composite soil samples from discrete locations in each Zone 2 and 3 stockpiles	One 10-part composite sample per 1,000 cubic yards of excavated soil from Zone 2 and Zone 3 stockpiles until all stockpiles are removed (disposed).	Soil	Total Metals (Lead and Arsenic) Toxicity characteristic leaching procedure (TCLP) Metals (Lead and Arsenic)
Air	Real-time Particulate Monitoring at the EC disposal stock pile site.	To establish a baseline condition, begin air sampling two-days before hauling activities to disposal stockpile site begin. Continue real-time monitoring daily at disposal stock pile site until all soil is properly disposed.	Air	Metals (Lead and Arsenic)

Task	Sampling Activity/Objective	Sampling Frequency/ Duration	Matrix	Parameters
Air	Perimeter Air Monitors at EC disposal stock pile site.	One day per week at three locations around the disposal stock pile site throughout the duration of construction activities.	Air	Metals (Lead, Arsenic and PM10)
Air	Real-time Particulate Monitoring at each Zone 2 Residential property with RD.	Start daily monitoring 4 days before beginning excavation to establish baseline condition in Zone 2. Continue real-time monitoring daily for the duration of earthwork activities at each property.	Air	Metals (Lead and Arsenic)
Air	Perimeter Air Monitors at each Zone 2 Residential property with RD.	Conduct daily sampling for the first 10-days of excavation and backfill at each property in Zone 2. Continue perimeter air sampling daily during excavation and backfill activities but only send filter cartridges for lab analysis if real-time particulate monitoring results exceed action levels.	Air	Metals (Lead and Arsenic)
Interior	Dust Exposure Monitoring and Lead-based Paint Screening (Zone 2 and 3)	Initiated after all exterior remediation work in Zone 2 and 3 is completed. Samples collected before and after interior dust cleaning and lead-based paint evaluation in key rooms.	Dust and Lead-based Paint	Metals (Lead and Arsenic)
Borrow Source - Backfill and Topsoil	QA for remediation consultant - Approval and Ongoing Compliance Sampling – Chemical.	10% of remediation consultants' samples. Sampled prior to excavation; minimum 1 per 1000 cyd	Soil	VOCs, SVOCs, Pesticides, Herbicides, PCBs and RCRA Metals

Task	Sampling Activity/Objective	Sampling Frequency/ Duration	Matrix	Parameters
Borrow Source - Topsoil	QA for remediation consultant - Approval and Ongoing Compliance Sampling – Chemical/Nutrient.	10% of remediation consultants' samples. Sampled prior to excavation; minimum 1 per 1000 cyd	Soil	Testing by agronomic soil testing laboratory to include: soil pH, organic matter, available phosphorus, exchangeable potassium, magnesium, calcium, cation exchange capacity, percent base saturation of cation elements, and recommended application rates for fertilizer, lime, or peat.
Borrow Source – Backfill and Topsoil	QA for remediation consultant - Approval and Ongoing Compliance Sampling - Physical	10% of remediation consultants' samples. Sampled prior to excavation; minimum 1 per 5000 cyd	Soil	Standard Proctor – ASTM International D698; Gradation – ASTM International C136; Atterberg Limits – ASTM International D4318

11.4 How "good" do the data need to be to support the environmental decision?

The data should meet the project action levels as specified in QAPP Worksheet #15 and the QC requirements that are explained in QAPP Worksheet #37.

Worksheet #15 presents analytical methods and limits. In addition to listing the particular analytes, screening levels, and limits, the table identifies where quantitation limits (QLs) or method detection limits (MDLs) are greater than project action limits (PALs). Although the information was taken into consideration when planning analytical protocol for the site and could lead to some uncertainty, it does not prevent conclusions from being drawn with respect to the project objectives for the following reasons:

- Even though some QLs are greater than the respective screening levels, MDLs are closer to and could be less than the applicable PALs. The laboratory instrumentation would likely detect a
- constituent if present at a concentration greater than its MDL, and such a result would be reported as estimated because it is less than the QL.
- If a particular analyte has a QL or MDL greater than a screening level and there are sufficient other analytes in the same constituent group that would likely be detected in the event of a release with a QL or MDL less than the screening values, then determinations for further action at the site can be made with sufficient confidence.

11.5 How many data are needed? (Number of samples for each analytical

group, matrix, and concentration)

Worksheet #17 (Sampling Design and Rationale) describes the field investigation activities. Worksheet #18 (Sampling Locations and Methods) summarizes the number of samples and the analytical parameters.

11.6 Where, when, and how should the data be collected/generated?

Detailed information on where, when, and how the data will be collected is provided in Worksheets #17 and #18.

11.7 Who will collect and generate the data?

Parsons will collect the soil, air and interior dust samples and send them for analysis. Parsons will also generate the data results from the lab analyses of these various environmental samples. Parsons subcontractor will provide Parsons with lab analysis results of backfill soil and topsoil for review to confirm they meet required specifications.

11.8 How will these data be reported?

The data will be reported in accordance with the procedures outlined in Worksheets #34, #35, #36. Observations of soil and site activities will be recorded in project-specific logbooks.

11.9 How will these data be archived?

The final evidence file will be the central repository for all documents that constitute evidence relevant to sampling and analysis activities. Parsons will be the custodian of the evidence file and will maintain the contents of the evidence files for the project, including relevant records, reports, logs, field notebooks, sketches, pictures, contractor reports, and data reviews in a secured area with limited access. Parsons will keep all records for 10 years after contract completion. As necessary, records may be transferred to an offsite records storage facility. The records storage facility will provide secure, controlled-access records storage.

Worksheet #12—Measurement Performance Criteria

The measurement performance criteria (MPC) for chemical analyses being performed for each matrix and analytical parameter are summarized in Worksheets 12-1 through 12-3. The MPCs follow those defined in the referenced EPA method or laboratory standard operating procedures (SOPs). The quality of the data to be collected for this project will be verified through appropriate MPCs established for both sampling procedures and analytical methods. The criteria relate to data quality indicators (DQIs) consisting of precision, accuracy, representativeness, comparability, completeness, and sensitivity. The DQIs are defined as follows:

- **Precision** refers to the reproducibility of measurements. Precision is usually expressed as standard deviation, variance, percent difference, or range, in either absolute or relative terms.
- **Accuracy** refers to the degree of agreement between an observed value (such as sample results) and an accepted reference value. A measurement is considered accurate when the reported value agrees with the true value or known concentration of the spike or standard within acceptable limits.
- **Representativeness** describes the extent to which a sampling design adequately reflects the environmental conditions of a site. Representativeness is determined by appropriate program design, with consideration of elements such as proper well locations, drilling and installation procedures, operations process locations, and sampling locations.
- **Comparability** addresses the degree to which different methods or data agree or can be represented as similar. Comparability is achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions, and using standard and comprehensive reporting formats.
- **Completeness** is a measure of the amount of valid data collected using a measurement system. Completeness is expressed as a percentage of the number of measurements that are specified in this QAPP.
- **Sensitivity** is the ability of a method or instrument to detect the target analytes at the level of interest. Sensitivity can be measured by calculating the percent recovery of the analytes at the detection limit, which is the minimum concentration of an analyte that can be routinely identified and quantified above the method detection limit by a laboratory.
- The quality of the sampling procedures and laboratory results will be evaluated for compliance with project DQOs through a review of overall DQIs, in accordance with procedures described in Worksheet #37 (Data Usability Assessment). The results will be summarized in an overall data usability report.

Worksheet #12-1 - Measurement Performance Criteria Table

Matrix:	Soil
Location:	Residential and Stockpile
Analytical Group:	Metals
Concentration Level:	Medium

Sample Procedure [a]	Analytical Method/Standard Operating Procedure (SOP) [b]	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPC)	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sample (S), Analytical (A) or Both (S&A)
SOP-02	SW-846 6010C/Laboratory HN-MET-015	Precision	Relative Percent Difference (RPD) +/- 20%	Field Duplicate	NA
			75-125%; RPD +/- 20%	Matrix Spike/Matrix Spike Duplicate (MS/MSD)	NA
			For sample results >50x the MDL, the %RSD between the serial dilution result and the sample results must be <20%	Serial Dilution	A
		Accuracy / Bias	See Worksheet #15	Laboratory Control Sample (LCS), MS/MSD, Post-Digestion Spike (PDS)	S&A
		Completeness	>95% Laboratory Analysis	Percent Completeness	S&A

	Representativeness	No target analytes > MDL	Method Blank, Equipment Blank, Calibration Blanks	S&A
	Comparability		LCS, MS/MSD	S&A

[a] Reference number from QAPP Worksheet #21.

[b] Reference number from QAPP Worksheet #23.

LCS = laboratory control sample, RPD = relative percent difference, MS = matrix spike, MSD = matrix spike duplicate, MDL = method detection limit, %RSD = percent relative standard deviation.

Worksheet #12-2 - Measurement Performance Criteria Table

Matrix:	Air
Location:	Residential and Stockpile
Analytical Group:	Metals
Concentration Level:	Medium

Sample Procedure [a]	Analytical Method/Standard Operating Procedure (SOP) [b]	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPC)	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sample (S), Analytical (A) or Both (S&A)
SOP-08	Laboratory IH-7300	Precision	Relative Percent Difference (RPD): Not Applicable	Field Duplicate	NA
			For sample results >50x the MDL, the %RSD between the serial dilution result and the sample results must be <10%	Serial Dilution	A

	Laboratory: IOM3.4 / SW6010B	Accuracy / Bias	See Worksheet #15	Laboratory Control Sample (LCS)	S&A
		Completeness	>95% Laboratory Analysis	Percent Completeness	S&A
		Representativeness	No target analytes > MDL	Method Blank, Equipment Blank, Calibration Blanks	S&A
		Comparability	See Worksheet #15	LCS, MS/MSD	S&A

[a] Reference number from QAPP Worksheet #21.

[b] Reference number from QAPP Worksheet #23.

Worksheet #12-3 - Measurement Performance Criteria Table

Matrix:	Air
Location:	Interior Air (Dust)
Analytical Group:	Metals
Concentration Level:	Medium

Sample Procedure [a]	Analytical Method/Standard Operating Procedure (SOP) [b]	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPC)	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sample (S), Analytical (A) or Both (S&A)
		Precision	Relative Percent Difference (RPD): Not Applicable	Field Duplicate	NA

SOP-071	SW846 6020A/Dust		For sample results >50x the MDL, the %RSD between the serial dilution result and the sample results must be <10%	Serial Dilution	A
	Laboratory HN-MET-015	Accuracy / Bias	See Worksheet #15	Laboratory Control Sample (LCS)	S&A
		Completeness	>95% Laboratory Analysis	Percent Completeness	S&A
		Representativeness	No target analytes > MDL	Method Blank, Equipment Blank, Calibration Blanks	S&A
		Comparability	See Worksheet #15	LCS, MS/MSD	S&A

[a] Reference number from QAPP Worksheet #21.

[b] Reference number from QAPP Worksheet #23.

Worksheet #12-4 - Measurement Performance Criteria Table

Matrix: Soil
Location: Borrow Source - Backfill and Topsoil
Analytical Group: RCRA Metals, VOCs, SVOCs, Pesticides, Herbicides and PCBs
Concentration Level: Low

Sample Procedure [a]	Analytical Method/Standard Operating Procedure (SOP) [b]	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPC)	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sample (S), Analytical (A) or Both (S&A)
		Precision	Relative Percent Difference (RPD) +/- 20%	Field Duplicate	NA

			75-125%; RPD +/- 20%	Matrix Spike/Matrix Spike Duplicate (MS/MSD)	NA
SOP-02	See footnote		For sample results >50x the MDL, the %RSD between the serial dilution result and the sample results must be <20%	Serial Dilution	A
		Accuracy / Bias	See Worksheet #15	Laboratory Control Sample (LCS), MS/MSD, Post-Digestion Spike (PDS)	S&A
		Completeness	>95% Laboratory Analysis	Percent Completeness	S&A
		Representativeness	No target analytes > MDL	Method Blank, Equipment Blank, Calibration Blanks	S&A
		Comparability		LCS, MS/MSD	S&A

[a] Reference number from QAPP Worksheet #21.

[b] Reference number from QAPP Worksheet #23.

Analytical Methods and SOPs: Volatile Organic Compounds by GC/MS (EPA 8260B) / HN-VMS-003; Semi-Volatile Organic Compounds by GC/MS (EPA 8270D) / HN-SMS-001; Organochlorine Pesticides (EPA 8081A) / HN-GC-001; Polychlorinated Biphenyls by EPA 8082 / HN-GC-002; Metals by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) (EPA 6020A) / HN-MET-008; Mercury Analysis of Solid Samples (EPA 7471A) / HN-MET-006 (Refer to Appendix A for SOPs)

Worksheet #13—Secondary Data Uses and Limitations

EPA will provide a specific list of all properties in Zone 2 that require XRF analysis of soils and a specific list of all properties in Zone 2 and 3 that will be considered for interior dust sampling and cleaning. Secondary data is not anticipated to be used to support this project.

Worksheets #14 and #16—Project Tasks and Schedule

14.1 Fieldwork/Sampling Tasks

Applicable SOPs for field tasks that require sampling are listed on Worksheet #21 and provided, as applicable, in the *Exterior Field Sampling Plan, Interior Residential Dust Cleaning and Sampling Plan* and the *Temporary Storage, Transportation and Disposal Plan* prepared by Parsons. The SOPs provide the necessary procedures and requirements for conducting the following sampling tasks.

- Mobilization activities associated with preparation for sampling activities.
- Collection of composite samples from disposal stockpiles for lead and arsenic analysis.
- Use XRF analysis of composite samples to verify where additional excavation is required. Perform additional excavation in 6-inch lifts followed by XRF screening until the equivalent RGs are achieved. Refer to Appendix D, Using a Vanta XRF for Decision-Making at Zone 2, USS Lead (USEPA Fields Group, John Canar and Chuck Roth, 2018). Composite samples will be submitted for laboratory analysis for lead and arsenic, if directed by EPA.
- Collect real-time air monitoring samples at two locations around the disposal stock piles.
- During the RA only, collect particulate samples using a perimeter air monitors at disposal stockpile site periodically in accordance with the air monitoring plan.
- Prior to RA collect baseline air monitoring samples at residential properties and disposal stock pile location.
- During the RA only, collect real-time air particulate monitoring samples at residential properties in accordance with the air monitoring plan.
- Interior dust from selected residences will be sampled in accordance with START contract-specific SOP No. 071, "Indoor Dust Sampling Using a High-Efficiency Particulate Air (HEPA) Vacuum" (See Appendix B in the *Interior Residential Cleaning and Sampling Plan*).
- Lead-based paint screening from selected residences will be conducted in accordance with the intent of Title 40 Code of Federal Regulations (CFR), Part 745.227, and U.S. Department of Housing and Urban Development's (HUD) Lead Safe Housing Rule (24 CFR Part 35).
- Efficacy samples from selected residences will be collected in accordance with START contract-specific SOP No. 071, "Indoor Dust Sampling Using a HEPA Vacuum" (See Appendix B in the *Interior Residential Cleaning and Sampling Plan*). In particular, efficacy samples will be collected from the exact same location as the pre-cleaning dust samples.

14.2 Analysis Tasks

The analytical laboratory ALS will analyze all project samples, except for the agronomic and geotechnical analyses. The specific analytical methods and SOPs for ALS are described in Worksheet #23. The contracted laboratories details are below:

ALS-Holland (soils and dust samples)

PM: Chad Whelton (Chad.Whelton@ALSGlobal.com; (616) 399 6070)

Address: 3352 128th Avenue, Holland, MI 49424

ALS-Cincinnati (air samples)

PM: Chad Whelton (Chad.Whelton@ALSGlobal.com; (616) 399 6070)

Address: 4388 Glendale Milford Road, Cincinnati, OH 45242

A & L Great Lakes Laboratories (agronomic analyses)

PM: Randall Warden (rwarden@algreatlakes.com; (260) 483 4759)

Address: 3505 Conestoga Dr. Fort Wayne, IN 46808

Environmental Protection Industries (EPI) (geotechnical analyses)

PM: Sergio Meilman (smeilman@environmental-epi.com; (708) 225 1115)

Address: 16650 S Canal Street South Holland, IL 60473

14.3 Quality Control Tasks

For items related to QC, see Worksheets #12, #15, #24, #25, #27, and #28.

14.4 Secondary Data

See QAPP Worksheet #13.

14.5 Data Management Tasks

This subsection serves as the initial general documentation of the project data management efforts. Additional documentation can be found in the Tetra Tech data management plan (2017) amended by Parsons (2018), which will be maintained to document specific issues such as database structure definitions, database inventories, database maintenance, user requests, database issues and problems, and client contact. All SOPs for data management related tasks are included in the Tetra Tech data management plan (2017) amended by Parsons (2018).

The following are the team members and their responsibilities for the data management process:

- **Project Chemist**—Responsible for reviewing the chain-of-custody forms and establishing the sample tracking system weekly. Reviews laboratory data for accuracy and quality and compares electronic outputs for accuracy to laboratory electronic copies. Conducts tracking of samples, forwards tracking information and received data to the database manager, and identifies the data inputs (for example, sample numbers) to use in generating tables and plots.

- **Database Manager**— Responsible for setting up the data management system in consultation with the project chemist at the beginning of the data management tasks. Oversees proper use of EPA's sample management system (Scribe) and accuracy of the information entered. Also oversees the data management process, including data conversion/manual entry into the data management system, QC of the entered data, and preparation of the required tables and plots of the data. Data deliverables are provided to the project chemist.
- **GIS Manager**— Responsible for coordinating with the construction manager to set up the geodatabase prior to sampling. Maintains spatial layers and overall geodatabase integrity and accuracy. Provides GIS- related outputs for reports.

14.6 Historical Data

Historical data has been used in preparation of the RD and determination of excavation depths or the need for additional vertical delineation. No data validation will be performed for historical data and entry of historical data into the database is not anticipated.

14.7 Sample Tracking

The project chemist is responsible for tracking samples in the sample tracking database to ensure that the analytical results for samples sent for analysis are received. Copies of chains of custody from the field team are used to enter in sample identifications (IDs), collection date, and analyses. Upon receipt of a sample receipt notice from the laboratory, the date received by the laboratory, and a date the electronic copy is due will be entered. Likewise, upon receipt of the electronic copy and electronic data deliverable (EDD), the date they were received also will be entered. The EDDs will be uploaded when received from the laboratory and will be tracked in the sample tracking table. Validation qualifiers will be added to the database and the results will be qualified accordingly.

14.8 Data Types

Data will be added to the project database as they become available. The data will include new data collected in the field by Parsons and data provided by the laboratory and validated by Parsons. The data sources will be noted in the database.

14.9 Data Tracking and Management

Analytical laboratory reports of chemical analysis results will be tracked individually in a consistent fashion. Every data set will be assigned a unique identifier. The date of receipt, status of data validation, and status of database entry for each data set will all be tracked and recorded in the project database.

14.10 Hard/Electronic Copy

Measurements made during field data collection activities will be recorded in field logbooks and sample processing logs. Field data will be reduced and summarized, tabulated, and stored along with the field logbooks and sample processing logs. All raw analytical laboratory data will be stored electronically.

14.11 Data Input Procedures

Sampling information, analytical results, applicable QA/QC data, data validation qualifiers, and other field-related information will be entered into the project database for storage and retrieval during data evaluation and report development. The analytical data will be loaded into the database using EDD files received from the analytical laboratory. Validation qualifiers will be entered manually. Other available field-related data collected will be manually entered onto standard EDD templates for loading into the database.

14.12 GIS Description

A project geodatabase will be agreed upon and set up prior to sampling by the SM, database manager, and GIS manager. Workflow for creating, maintaining, and organizing geospatial data will follow the Spatial Data Standard format for projects whenever possible. Geospatial features will be prepared in the coordinate system and datum of Universal Transverse Mercator North America Datum of 1983 in meters for the EPA Region 5 EDD submission.

An ArcView project or extension will be used providing the following functionality: load and display project site base maps; display sampling station locations and associated sampling data (date, media, and results); and perform ad hoc queries to highlight sampling locations meeting user-entered criteria for sampling (for example, data by date, sample type, analyte, depth/elevation, result value, or any combination thereof). Results will be shown as stations highlighted on the map.

For additional details on the requirements of geographic information systems data management, refer to the data management plan (Parsons 2018).

14.13 Documentation

Documentation of data management activities is critical because it provides the following:

- An electronic copy record of project data management activities
- Reference information critical for database users
- Evidence that the activities have been properly planned, executed, and verified
- Continuity of data management operations when personnel changes occur

14.14 Evidence File

The final evidence file will be the central repository for all documents that constitute evidence relevant to sampling and analysis activities. Parsons is the custodian of the evidence file and maintains the contents of the evidence files for the project, including all relevant records, reports, logs, field notebooks, sketches, pictures, contractor reports, and data reviews in a secured area with limited access.

Parsons will keep all records until project completion and closeout. As necessary, records may be transferred to an offsite records storage facility. The records storage facility must provide secure, controlled-access records storage. Records of raw analytical laboratory data, QA data, and reports will be kept by the subcontracted laboratory for 10 years.

14.15 Presentation of Data

Depending on data user needs, data presentation may consist of any of the following formats:

Tabulated results of data summaries or raw data

- Figures showing location-specific concentrations
- Tables providing statistical evaluation or calculation results
- Presentation graphics from computer software as ARCINFO, ARCGIS, PowerPoint or similar analysis A/EA presentation aids

In addition to laboratory data, other physical data will be collected during field efforts. The information will be stored in the project database. Other types of data elements may be added as the field investigation needs and activities evolve.

14.16 Assessment and Audit Tasks

See Worksheets #31, #32, and #33.

14.17 Data Review Tasks

The laboratory will ensure data are complete for all samples received. Laboratory data will be validated by Parsons using the National Functional Guidelines, laboratory SOPs, and the QAPP.

Validated data and field logs will be reviewed to assess total measurement error and determine overall usability of the data for project purposes. Final data are placed in the database with qualifiers.

Additionally, the Parsons chemist will perform a 10 percent verification of the validated results against the EDD and hardcopy prior to data use.

See Worksheets #34 though #37 for the tasks.

14.18 Documentation and Records

Records and field measurements of all samples will be collected in data sheets. Chains of custody, airbills, and sample logs will be prepared and retained for each sample. A copy of the final QAPP will be kept at the Parsons Austin office and at the job site.

14.19 Worksheet Sheet 16-1 Project Schedule

Project schedules for RA in both Zone 2 and Zone 3 are provided below in Worksheets #14 and #16.

Worksheet #14 Zone 2 Remedial Action Work Schedule

Item	Description of Deliverable / Task	Schedule Deadline Dates (dates are "no later than" dates) ("days" are calendar days)	Calendar Due Dates
1	**Submit Statement of Qualifications and Quality Management Plan**	10 days after the Effective Date (1/19/2018)	January 29, 2018 with agreed follow-up on February 2, 2018
2	**Designate and notify EPA of Respondents' Community Involvement Coordinator**	30 days after 2/5/2018	March 7, 2018
3	**Submit Z2 RAWP** including the **HASP, ERP, FSP, QAPP, and C-SWPPP** subplans	60 days after EPA's Notice of Authorization to Proceed (2/5/2018)	April 6, 2018
4	Submit remaining subplans (except the Z2 O&M Plan and the ICIAP)	75 days after 2/5/2018	April 23, 2018
5	**Review EPA Remedial Action Designs**		March 30, 2018
6	**Prepare Progress Reports** covering all acitivities that took place in the month prior to the submittal	Commencing in the month following the approval of the Z2 RAWP, Respondents shall submit progress reports to EPA on a monthly basis	Approval date of RAWP is not yet known -10 days into next month from previous month-
7	**Notify EPA of Progress Report Schedule Changes**	Respondents shall notify EPA of changes to scheduled activities at least 7 days before performance of the activity	
8	**Designate IQAT** (either a third party or the Supervising Contractor)	30 days after 2/5/2018	March 7, 2018
9	**Hold Initial Preconstruction Conference**	60 days after 2/5/2018	April 6, 2018
10	**Hold Second Preconstruction Conference**	5 days before the Start of Z2 RA Construction	TBD
11	**Start Z2 RA Construction and Air and Soil Sampling** (which includes mobilization for Z2 RA Construction)	The later of: (i) 30 days after Approval of Z2 RAWP; (ii) 14 days after the date of the Final ESD; or (iii) such other time as EPA may require (provided that EPA has both approved the Z2 RAWP and issued the Final ESD)	TBD
12	**Hold Periodic Meetings** during the construction portion of the Z2 RA with EPA, and others as directed by EPA, to discuss construction issues		Monthly
13	**Submit Z2 O&M Plan**, if properties remain that are other than Unrestricted Use/Unrestricted Access	60 days before Completion of Z2 RA Construction	
14	**Submit ICIAP**, if Institutional Controls are necessary	60 days before Completion of Z2 RA Construction	
15	**Complete Z2 RA Construction and Air and Soil Sampling**	Per approved Z2 RA Construction Schedule	June 30, 2018
	Data Validation	TBD	TBD
16	**Conduct Z2 RA Construction Completion Inspection**	As scheduled by Respondents when they believe the Z2 RA Construction is completed	
17	**Notify EPA of the expected date of final demobilization** and regularly update that expected date in subsequent monthly Progress Reports	No later than 6 months prior to Respondents' expected date of final demobilization of Z2 RA Construction	
18	**Submit Z2 RA Construction Report**	60 days after Z2 RA Construction Completion Inspection	
19	**Hold Z2 RA Completion Meeting** (may be consolidated with Z2 RA Construction Completion Inspection if Institutional Controls are not necessary)	As scheduled by Respondents when they believe the Z2 RA is completed	
20	**Submit Z2 RA Completion Report** (required only if Institutional Controls are necessary)	60 days after Z2 RA Completion Meeting (Item 10)	
21	**Hold Z2 RA Work Completion Meeting** (may be consolidated with Z2 RA Construction Completion Inspection and Z2 RA Completion Meeting if Institutional Controls are not necessary)	As scheduled by Respondent when they believe the Z2 RA Work is completed	
22	**Submit Z2 RA Work Completion Report** (required only if Institutional Controls are necessary)	60 days after the Z2 RA Work Completion Inspection	
23	**Perform Periodic Review Support Plan**, if required	Four years after start of Z2 RA Construction	

Worksheet #16 Zone 2 & 3 Interior Sampling and Cleaning Work Schedule

Item	Description of Deliverable / Task	Schedule Deadline Dates (dates are "no later than" dates) ("days" are calendar days)	Calendar Due Dates
1	**Submit Z2&3 Interior Work Plan**	60 days after EPA's Notice of Authorization to Proceed (2/5/2018)	April 6, 2018
2	**Designate IQAT** (either a third party or the Supervising Contractor)	30 days after 2/5/2018	March 7, 2018
3	**Hold Pre-Implementation Conference**	60 days after 2/5/2018	April 6, 2018
4	**Secure and maintain commercial general liability insurance with limits of $1 million, and automobile insurance with limits of liability of $1 million per accident, and umbrella liability insurance with limits of $5 million in excess of the required commercial and automobile liability limits**	15 days before commencing any on-site Z2&3 Interior Work	
5	**Begin Z2&3 Interior Sampling and Cleaning Work**	Z2: Year the completion of exterior restoration Z3: After notification by EPA that exterior restoration of a property is complete	Varies
6	**Hold Periodic Progress Meetings** during the Z2&3 Interior Sampling and Cleaning Work with EPA, and others as directed by EPA, to discuss performance issues		Monthy
7	**Prepare Progress Reports** covering all acitivities that took place in the month prior to the submittal	Commencing in the month following the Effective date of the Z2&3 Interior UAO and until EPA certifies the Z2&3 Interior Sampling and Cleaning Work Completion Respondents shall submit progress reports to EPA on a monthly basis	Monthly starting in February 2018 but EPA and Respondents believe this is too early and are discussing appropriate start date
8	**Notify EPA of Progress Report Schedule Changes**	Respondents shall notify EPA of changes to scheduled activities at least 7 days before performance of the activity	
9	**Complete Z2&3 Interior Sampling and Cleaning Work**	Per approved Z2&3 Interior Sampling and Cleaning Work Schedule	
	Data Validation	TBD	TBD
10	**Hold Z2&3 Interior Sampling and Cleaning Work Completion Meeting**	60 days after Completion of Z2&3 Interior Sampling and Cleaning Work	
11	**Submit Z2&3 Interior Sampling and Cleaning Work Completion Report**	60 days after the Z2&3 Interior Sampling and Cleaning Work Completion Meeting	
12	**Retain Records**	a minimum of 10 years after EPA provides certification of the Completion of the Z2&3 Interior Sampling and Cleaning Work	

Worksheet #15-1—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Note: Agronomic and Geotechnical laboratories project action limits are not applicable.

Matrix: **Soil and Residential Interior Dust**
Location: **Zone 2 & 3**
Analytical Group: **Metals by 6010C and 6020A**
Laboratory: **ALS-Holland**
Concentration Level: **Low**

Test Method	Test Name	Matrix	Analyte	CAS #	Project Action Limits (mg/Kg)	MDL (mg/Kg)	RL (mg/Kg)	LCS/LCSD (%)	MS/MSD (%)	RPD
SW6010C	Metals Analysis by ICP	Soil	Arsenic	7440-38-2	26	0.06	0.25	80-120	75-125	20
SW6010C	Metals Analysis by ICP	Soil	Lead	7439-92-1	400	0.05	0.25	80-120	75-125	20
SW6020A	Metals Analysis by ICP-MS	Soil/Dust	Arsenic	7440-38-2	See Table 15-2	0.037	0.75	80-120	75-125	25
SW6020A	Metals Analysis by ICP-MS	Soil/Dust	Lead	7439-92-1	See Table 15-2	0.004	0.75	80-120	75-125	25

Project Action Limit Reference for total metals in soil: Remedial Action Level (RAL), Record of Decision (EPA 2012).

Worksheet #15-2—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Matrix: Residential Interior Dust
Location: Zone 2 & 3 Interior
Analytical Group: Metals
Laboratory: ALS-Holland
Concentration Level: Low

Tasks	Method/Matrix	Parameter	Method Detection Limit	Reporting Limit	Concentration of Concern
Pre-cleaning screening levels	SW-846 6020A/ Dust	Lead	0.004 mg/kg	0.75 mg/kg	316 mg/kg
		Arsenic	0.037 mg/kg	0.75 mg/kg	26 mg/kg
Post-cleaning efficacy screening levels	START contract-specific SOP No. 071, "Indoor Dust Sampling Using a HEPA Vacuum"	Lead	-	-	25 µg/ft^2
		Arsenic	-	-	36 µg/ft^2
Lead-based paint screening levels	Heuresis Pb200i XRF User Manual (Heuresis 2015a), and in accordance with "U.S. Department of Housing and Urban Development Guidelines for the Evaluation and Control of Lead-Based Paint" (HUD 2012)	Lead	-	-	1 mg/cm^2

Pre-cleaning dust sampling will be collected in accordance with START contract-specific SOP No. 071, "Indoor Dust Sampling Using a High-Efficiency Particulate Air (HEPA) Vacuum" (See Appendix B in the Interior Residential Dust Cleaning and Sampling Plan). Lead-based paint screening will be conducted in accordance with the intent of Title 40 Code of Federal Regulations (CFR), Part 745.227, and U.S. Department of Housing and Urban Development's (HUD) Lead Safe Housing Rule (24 CFR Part 35). Post-cleaning efficacy dust samples will be evaluated in accordance with the intent of HUD's Lead Safe Housing Rule (HUD 2012) and the Toxic Substances Control Act (TSCA). All interior dust sampling methods, frequency, and SOPs can be found in the Parsons Interior Residential Dust Cleaning and Sampling Plan.

Worksheet #15-3—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Matrix: Soil
Location: Zone 2 & Zone 3
Analytical Group: Metals by 6010C
Laboratory: ALS-Holland
Concentration Level: Low

Test Method	Test Name	Matrix	Analyte	CAS #	Project Action Limits (mg/L)	MDL (mg/L)	RL (mg/L)	LCS/LCSD (%)	MS/MSD (%)	RPD
SW6010C	Metals Analysis by ICP	TCLP	Arsenic	7440-38-2	5	0.016	0.05	80-120	75-125	20
SW6010C	Metals Analysis by ICP	TCLP	Lead	7439-92-1	5	0.013	0.05	80-120	75-125	20

Project Action Limits: TCLP = Code of Federal Regulations, 40 CFR §261.24.

Worksheet #15-4—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Matrix: Air
Location: Zone 2 & 3 Stockpiles
Analytical Group: Gravimetric, Total Particulates as PM-10 and Metals by IOM 3.4 and 6010B
Laboratory: ALS-Cincinnati
Concentration Level: Low

Test Method	Test Name	Matrix	Analyte	CAS #	Project Action Limits/Permissible Exposure Limits (µg/m^3)	MDL (µg/Sample)	RL (µg/ Sample)	LCS/LCSD (%)	MS/MSD (%)	RPD
PM-10	N/A	Air	Particulate Matter	N/A	See footnote	N/A	1000	N/A	N/A	N/A
IOM 3.4 and EPA 6010B	Metals Analysis by ICP	Air	Arsenic	7440-38-2	10	2.7	25	N/A	N/A	N/A
IOM 3.4 and EPA 6010B	Metals Analysis by ICP	Air	Lead	7439-92-1	50	1.2	25	N/A	N/A	N/A

Project Action Limits: The PM10 action level will be 100 µg/m^3 above background for a 15-minute average and greater than 150 µg/m^3 in the downwind area.

Permissible Exposure Limits (PEL) for Arsenic and Lead: http://www.dir.ca.gov/title8/ac1.pdf, accessed February 24, 2017

Worksheet #15-5—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Matrix: Outdoor Air
Location: Zone 2 & 3 Residential Exterior Air
Analytical Group: Metals NIOSH 7300
Laboratory: ALS-Cincinnati
Concentration Level: Low

Test Method	Test Name	Matrix	Analyte	CAS #	Project Action Limits/Permissible Exposure Limits (µg/m3)	MDL (µg/Sample)	RL (µg/Sample)	LCS/LCSD (%)	MS/MSD (%)	RPD (%)
NIOSH 7300	Metals Analysis by ICP	Air	Arsenic	7440-38-2	10	0.07301	1	N/A	N/A	N/A
NIOSH 7300	Metals Analysis by ICP	Air	Lead	7439-92-1	50	0.04266	1	N/A	N/A	N/A

Permissible Exposure Limits (PEL) for Arsenic and Lead: http://www.dir.ca.gov/title8/ac1.pdf, accessed February 24, 2017

General Notes for Table 15-1 to 15-5:

1) mg/kg = milligram per kilogram, µg/ft2 = micrograms per square foot, µg/Sample = micrograms per sample; mg/L = milligram per liter
2) Field QC samples, including field duplicates, MS, or MSD are not applicable or required.
3) Residential Interior Dust analysis includes coarse, fine and total fractions. The total fractions are calculated by the laboratory.
4) Laboratory limits subject to change as new MDL studies are performed and/or improvements in sensitivity are demonstrated.

Worksheet #15-6—Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Matrix: Backfill and Topsoil
Location: Zone 2 & 3 Borrow Source
Analytical Group: Refer to Table Below
Laboratory: ALS-Holland
Concentration Level: Low

Analyte Name	CAS No.	Soil RSL (mg/kg)	MDL*	PQL*	LCS Low (%)	LCS High (%)	MS/MSD Low (%)	MS/MSD High (%)	RPD (%)
HERBICIDES									
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	630	0.0014	0.0033	50	150	50	150	30
Silvex (2,4,5-TP)	93-72-1	510	0.0017	0.0033	50	150	50	150	30
2,4-D	94-75-7	700	0.0007	0.0066	40	150	40	150	30
2,4-DB	94-82-6	1,900	0.0009	0.0066	40	150	40	150	30
Dalapon	75-99-0	1,900	0.0012	0.0033	30	150	30	150	30
Dicamba	1918-00-9	1,900	0.0013	0.0033	40	150	40	150	30
Dinoseb	88-85-7	63	0.0014	0.0033	40	150	40	150	30
MCPA	94-74-6	32	0.1	0.66	40	150	40	150	30
MCPP	93-65-2	63	0.16	0.66	40	150	40	150	30
METALS by SW6010C									
Arsenic[1]	7440-38-2	14.1	0.065	0.25	80	120	75	125	20
Barium	7440-39-3	15,000	0.1	0.25	80	120	75	125	20
Cadmium	7440-43-9	71	0.024	0.5	80	120	75	125	20
Chromium, Total[2]	7440-47-3	120,000	0.014	0.25	80	120	75	125	20
Lead[1]	7439-92-1	56.6	0.053	0.25	80	120	75	125	20

Matrix: Backfill and Topsoil
Location: Zone 2 & 3 Borrow Source
Analytical Group: Refer to Table Below
Laboratory: ALS-Holland
Concentration Level: Low

Analyte Name	CAS No.	Soil RSL (mg/kg)	MDL*	PQL*	LCS Low (%)	LCS High (%)	MS/MSD Low (%)	MS/MSD High (%)	RPD (%)
Mercury	7439-97-6	11	0.0033	0.02	80	120	75	125	35
Selenium	7782-49-2	390	0.14	0.5	80	120	75	125	20
Silver	7440-22-4	390	0.031	0.25	80	120	75	125	20
PAHs[3] by SW8270D-SIM									
2-Methylnaphthalene	91-57-6	240	0.00061	0.00333	50	110	50	110	40
Acenaphthene	83-32-9	3,600	0.00043	0.00333	35	110	35	110	40
Anthracene	120-12-7	18,000	0.00076	0.00333	45	125	45	125	40
Benzo(a)anthracene	56-55-3	1.8	0.0006	0.00333	50	105	50	105	40
Benzo(a)pyrene	50-32-8	2.1	0.00083	0.00333	40	135	40	135	40
Benzo(b)fluoranthene	205-99-2	2.1	0.00069	0.00333	55	120	55	120	40
Benzo(k)fluoranthene	207-08-9	11	0.0006	0.00333	55	120	55	120	40
Chrysene	218-01-9	110	0.00058	0.00333	55	120	55	120	40
Dibenz (a, h) anthracene	53-70-3	0.42	0.00106	0.00333	45	115	45	115	40
Fluoranthene	206-44-0	2,400	0.00054	0.00333	40	135	40	135	40
Fluorene	86-73-7	2,400	0.0006	0.00333	45	105	45	105	40
Indeno(1,2,3-CD) pyrene	193-39-5	1.6	0.00113	0.00333	55	135	55	135	40
Naphthalene	91-20-3	3.8	0.00048	0.00333	50	110	50	110	40

Matrix: Backfill and Topsoil
Location: Zone 2 & 3 Borrow Source
Analytical Group: Refer to Table Below
Laboratory: ALS-Holland
Concentration Level: Low

Analyte Name	CAS No.	Soil RSL (mg/kg)	MDL*	PQL*	LCS Low (%)	LCS High (%)	MS/MSD Low (%)	MS/MSD High (%)	RPD (%)
Pyrene	129-00-0	1,800	0.00091	0.00333	50	115	50	115	40
PCBs by SW8082									
PCB-1016 (Arochlor 1016)	12674-11-2	4.1	0.02286	0.0667	50	130	40	140	50
PCB-1221 (Arochlor 1221)	11104-28-2	0.2	0.02286	0.0667	--	--	--	--	--
PCB-1232 (Arochlor 1232)	11141-16-5	0.17	0.02286	0.0667	--	--	--	--	--
PCB-1242 (Arochlor 1242)	53469-21-9	0.23	0.02286	0.0667	--	--	--	--	--
PCB-1248 (Arochlor 1248)	12672-29-6	0.23	0.02286	0.0667	--	--	--	--	--
PCB-1254 (Arochlor 1254)	11097-69-1	0.24	0.01862	0.0667	--	--	--	--	--
PCB-1260 (Arochlor 1260)	11096-82-5	0.24	0.01862	0.0667	50	130	40	140	50
PESTICIDES by SW8081A									
Aldrin	309-00-2	0.039	0.00073	0.01	50	150	50	150	35
alpha-BHC	319-84-6	0.086	0.00096	0.01	50	150	50	150	35
beta-BHC	319-85-7	0.3	0.00093	0.01	50	150	50	150	35
gamma-BHC	58-89-9	0.57	0.00097	0.01	50	150	50	150	35
Chlordane[4]	12789-03-6	1.7	0.009915	0.025	--	--	--	--	--
DDD	72-54-8	1.9	0.00112	0.01	50	150	50	150	35
p,p'-DDE	72-55-9	2	0.00134	0.01	50	150	50	150	35
DDT	50-29-3	1.9	0.00142	0.01	50	150	50	150	35

Matrix: Backfill and Topsoil
Location: Zone 2 & 3 Borrow Source
Analytical Group: Refer to Table Below
Laboratory: ALS-Holland
Concentration Level: Low

Analyte Name	CAS No.	Soil RSL (mg/kg)	MDL*	PQL*	LCS Low (%)	LCS High (%)	MS/MSD Low (%)	MS/MSD High (%)	RPD (%)
Dieldrin	60-57-1	0.034	0.00112	0.01	50	150	50	150	35
Endosulfan	115-29-7	470	0.00096	0.01	50	150	50	150	35
Endrin	72-20-8	19	0.00103	0.01	50	150	50	150	35
Heptachlor	76-44-8	0.13	0.00075	0.01	50	150	50	150	35
Heptachlor epoxide	1024-57-3	0.07	0.00096	0.01	50	150	50	150	35
Methoxychlor	72-43-5	320	0.00129	0.01	50	150	50	150	35
Toxaphene	8001-35-2	0.49	0.0108	0.06	--	--	--	--	--
SVOCs by SW8270D									
1,1'-Biphenyl	92-52-4	47	0.00541	0.033	30	120	30	120	30
1,2,4,5-Tetrachlorobenzene	95-94-3	23	0.0259	0.333	30	120	30	120	30
2,2'-0xybis(1-chloropropane)	108-60-1	3,100	0.00781	0.033	20	115	20	115	30
2,3,4,6-Tetrachlorophenol	58-90-2	1,900	0.00868	0.067	30	120	30	120	30
2,4,5-Trichlorophenol	95-95-4	6,300	0.0091	0.033	50	110	50	110	30
2,4,6-Trichlorophenol	88-06-2	49	0.00887	0.033	45	110	45	110	30
2,4-Dichlorophenol	120-83-2	190	0.00702	0.033	45	110	45	110	30
2,4-Dimethylphenol	105-67-9	1,300	0.00681	0.033	30	105	30	105	30
2,4-Dinitrophenol	51-28-5	130	0.018	0.033	15	130	15	130	30
2,4-Dinitrotoluene	121-14-2	1.7	0.00868	0.033	50	115	50	115	30

Matrix: Backfill and Topsoil
Location: Zone 2 & 3 Borrow Source
Analytical Group: Refer to Table Below
Laboratory: ALS-Holland
Concentration Level: Low

Analyte Name	CAS No.	Soil RSL (mg/kg)	MDL*	PQL*	LCS Low (%)	LCS High (%)	MS/MSD Low (%)	MS/MSD High (%)	RPD (%)
2,6-Dinitrotoluene	606-20-2	0.36	0.0055	0.033	50	110	50	110	30
2-Chloronaphthalene	91-58-7	4,800	0.00466	0.00667	45	105	45	105	30
2-Chlorophenol	95-57-8	390	0.0105	0.033	45	105	45	105	30
2-Methylphenol	95-48-7	3,200	0.00901	0.033	40	105	40	105	30
2-Nitroaniline	88-74-4	630	0.00764	0.033	45	120	45	120	30
3,3'-Dichlorobenzidin	91-94-1	1.2	0.00495	0.167	30	120	30	120	30
4,6-Dinitro-2-methylphenol	534-52-1	5.1	0.00837	0.033	40	130	40	130	30
4-Chloro-3-methylpheno	59-50-7	6,300	0.0095	0.033	45	115	45	115	30
4-Chloroaniline	106-47-8	2.7	0.00527	0.067	15	110	15	110	30
4-Nitroaniline	100-01-6	27	0.0517	0.167	35	150	35	150	30
Acetophenone	98-86-2	7,800	0.00522	0.033	30	120	30	120	30
Atrazine	1912-24-9	2.4	0.00525	0.033	30	120	30	120	30
Benzaldehyde	100-52-7	170	0.0512	0.067	10	60	10	60	30
Butylbenzylphthalate	85-68-7	290	0.00564	0.033	50	125	50	125	30
bis(2-Chloroethoxy) Methane	111-91-1	190	0.0032	0.033	45	110	45	110	30
bis(2-Chloroethyl) ether	111-44-4	0.23	0.00944	0.033	40	105	40	105	30
bis(2-Ethylhexyl)phthalate	117-81-7	39	0.00578	0.033	45	125	45	125	30